Name _____ Period _____ Date _____

Visualizing Nucleosomes in JSMol

7.1.S2: Utilization of molecular visualization software to analyze the association between protein and DNA within a nucleosome (Oxford Biology Course Companion page 348).

- Identify nucleosome structures using molecular visualization software.
- Outline the mechanism of histone-DNA association.

Using the prompts below, take notes on the various aspects of the nucleosome revealed by the visualization software.

- *Go to the site: https://www.mcb.ucdavis.edu/courses/jsmol/Nucleosomejs.htm*
  - *The* site sometimes won't open in Chrome. Use Firefox or Explorer.

1. **Describe the function of a nucleosome in your own words.**

- *Click and drag the structure from the website to view it at different angles.*
- *Click on the link- Show Proteins as Cartoons.*

2. **Can you tell how many times the DNA is wound around the histones?** *If you need to, click on: Hide Protein.*

- Rotate the nucleosome on its side.

3. **Jot down a quick sketch of its structure. Label the DNA and histone proteins.**

- *Click on: Restore Original View, Hide DNA, Change Protein to Spacefilling, and then Make each Protein a Different Color.*

4. **How many Blue H3 histones do you notice?**

5. **Make note of how many of histone proteins H2A, H2B, H4 and H3 there are in your sketch.**

- *Click on: Restore Original View, then Hide DNA, and then Show Protein as Cartoons.*
- Do you notice the tails coming off each histone? More on these later when we get to gene expression!
- *Click on: Restore Original View, then Show Lys and Arg as Spacefill. This highlights the amino acids Lysine and Arginine.*

6. **Where in the nucleosome are the amino acids found: The DNA coils or the histone proteins?**
7. **Make note of this in your sketch.**
8. Lysine and Arginine are both positively charged amino acids. **Predict why there are so many copies of this amino *acid and what role it could play in the nucleosome function.***